SUB450

(TSS-450 SYSTEM)

SERVICE MANUAL

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SUB450 Specifications

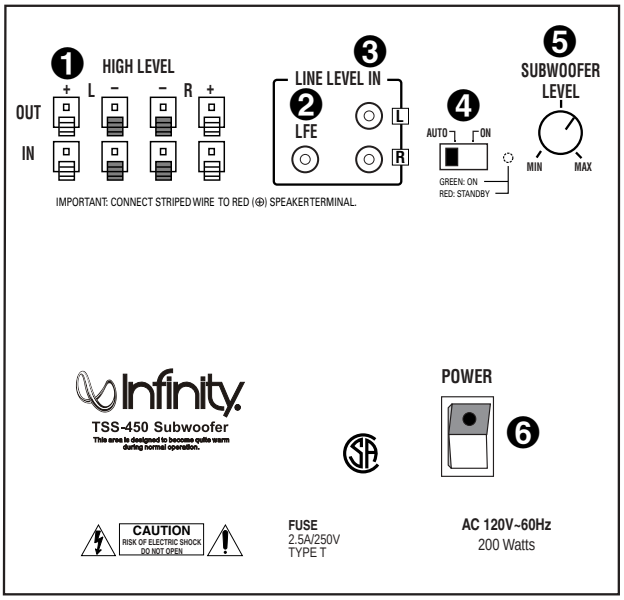
Frequency Range:	39Hz – 150Hz (±3dB)
Amplifier Output:	100 watts RMS, 500 watts Peak
Low-Frequency Driver:	8" (203mm)
Crossover Frequency:	50Hz – 150Hz, 24dB/Octave, continuously variable
Dimensions (H x W x D):	16-1/4" x 10-1/4" x 15-1/2" (413mm x 262mm x 394mm)
Weight:	28.3 lb (12.9kg)

Infinity continually strives to update and improve existing products, as well as create new ones. The specifications and construction details in this and related Infinity publications are therefore subject to change without notice.

SUB450 Amplifier 100W Powered Sub/ Plate Amp

LINE VOLTAGE	Yes/No	Hi/Lo Line	Unit	Notes	
US 120vac/60Hz	Yes	108-132	Vrms	Normal Operation	
Asia 100vac/50Hz	Yes	90-110	Vrms	Normal Operation	

Parameter	Specification	Unit	QA Test Limits	Conditions	Notes
Amp Section					
Type (Class AB, D, other)	AB	AB	n/a		External Sink required for Class AB
Load Impedance (speaker)	4	Ohms	n/a	Nominal	Z-curve required
Rated Output Power	100	Watts	95	1 input driven	
THD@ Rated Power	0.08	%	0.3	22k filter	
THD @ 1 Watt	0.1	%	0.5	22k filter	
DC Offset	10	mV-DC	20	@ Speaker Outputs	
Damping factor	>100	DF	50		Measured at speaker terminals, Output power 90 Watts THD 0.1 %
Input Sensitivity					
Input Frequency	50	Hz	50	Nominal Freq.	1 input driven
Line Input (L&R)	250	mVrms	±2dB	To Rated Power	1 input driven
LFE Input	135	mVrms	±2dB	To Rated Power	LFE input driven only
Speaker/Hi Level Input	2.5	Vrms	±2dB	To Rated Power	(-20 dB below Line In)...1 input driven
Signal to Noise					
SNR-A-Weighted	100	dBA	90	rel. to rated power	A-Weighting filter
SNR-unweighted	80	dBr	75	rel. to rated power	22k filter
SNR @ 1W-unweighted	60	dBr	55	rel. to 1W Output	22k filter
Residual Noise Floor	1.5	mVrms	2.5	Volume @max, using RMS reading DMM/VOM (or A/P)	
Residual Noise Floor	1	mVrms(max)	2	Volume @max, w/ A/P Swept Bandpass Measurement (Line freq.+ harmonics)	
Input Impedance					
Line input L&R , LFE	>15	K ohms	n/a	Nominal	
Speaker/Hi Level Input	4.7	K ohms	n/a	Nominal	
Filters					
Low Pass (fixed or variable)	fixed	--	±2dB		
Slope & Q		dB/Octave	n/a		
Subsonic filter (HPF)		Hz	±2dB		
Slope & Q		dB/Octave	n/a		
Limiter (yes/no)	YES	--	n/a		
Features					
LFE Input	YES		functional		BW Limited to 500 Hz
Volume pot Taper (lin/log)	log	--	functional		
ATO	YES		functional		
Input Configuration					
Line In (L,R)	L ,R	--	functional		RCA inputs: L , R Summed to Mono
Line level in LFE	LFE		functional		
Spkr/Hi Level In (L,R)	L,R	--	functional		L R Summed to Mono
Signal Sensing (ATO)					
Auto-Turn-On (yes/no)	YES	--	functional		
ATO Input Frequency	50	Hz	functional		
ATO Level	2	mV	functional	driven	
ATO Turn-on time	5	ms	functional	AC on, signal applied	
Auto Mute/ Turn-OFF Time	15	minutes	functional	T before muting, after signal is removed	Auto turn of time (T) must be 10 > T <15
Power on Delay time	3	sec.	functional	AC Power Applied	
Transients/Pops					
ATO Transient	5	mV-peak	10	@ Speaker Outputs	
Turn-on Transient	50	mV-peak	100	@ Speaker Outputs	AC Line cycled from OFF to ON
Turn-off Transient	50	mV-peak	100	@ Speaker Outputs	AC Line cycled from ON to OFF
Efficiency					
Stand-by Input Power	13	Watts	15	@ nom. line voltage	Maximum allowable input power.
Power Cons.@rated power	185	Watts	195	@ nom. line voltage	100 Watts @ 4 Ohms nominal line voltage
Protection					
Short Circuit Protection	YES	--	functional	Direct short at output	
Thermal Protection	65 deg. C	--	functional	@1/8 max unclipped Power	rise
DC Offset Protection	YES	--	functional	DC present at Speaker Out leads	Relay or crowbar (for driver/fire protection)
Line Fuse Rating	2.5	Amps	2.5	Type-T or Slo Blo	External fuse with UL/SEMKO rated holder



❷ LFE Input

❸ Line-Level Inputs

❹ AUTO/On Switch

❺ Subwoofer Level Control

❻ Power Switch

Subwoofer Controls

Rear Panel

A Few Suggestions

We recommend that you do not operate your speakers or subwoofer with the bass, treble and loudness controls set to full boost. This will place undue strain on your electronics and speakers and could damage them.

The volume control setting on your processor/preamp or receiver is not a specific indication of the overall loudness level of the speakers. The only important consideration is the loudness level at which the system can be played, regardless of where the volume control is set.

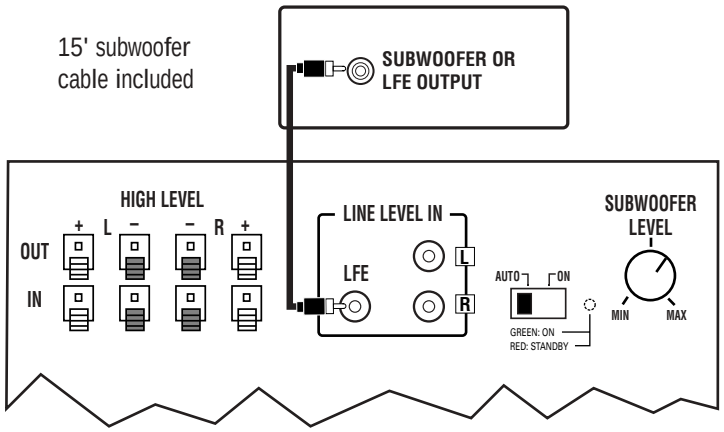
Always turn down the volume control setting on your processor/preamp or receiver when changing a cassette or CD, or switching inputs to AM or FM operation. Excessively loud transients (clicks or popping sounds) can damage the satellite speakers and possibly the subwoofer.

Important!

Whenever changing cables, pulling plugs, etc., ALWAYS TURN OFF ALL EQUIPMENT, including the subwoofer.

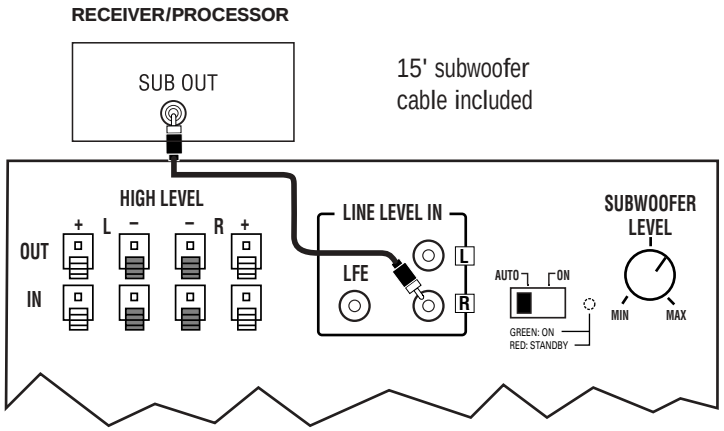
SUBWOOFER CONNECTIONS

If you have a Dolby* Digital or DTS® receiver/ processor with a low-frequency-effects (LFE) or subwoofer output:



Set line-level/LFE switch to "LFE."

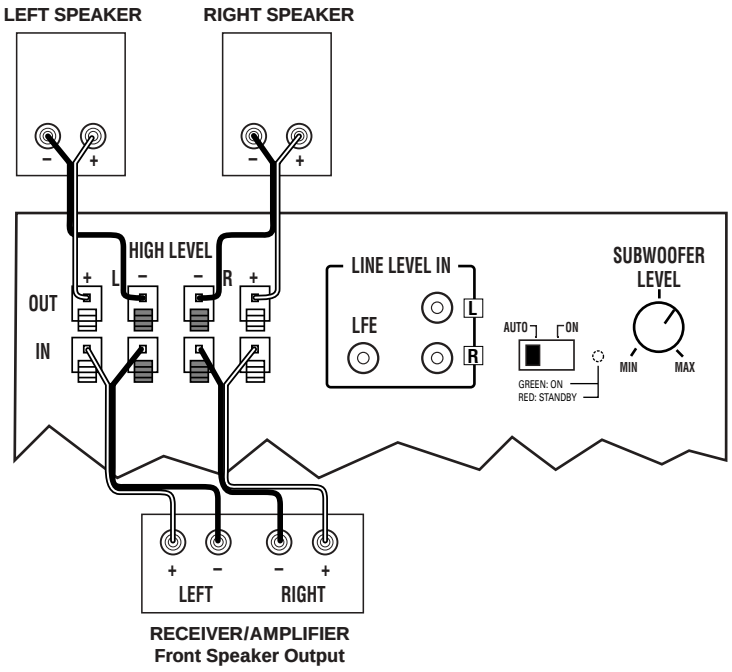
If your receiver/processor does not contain a Dolby Digital or DTS processor but has a subwoofer output:



Set line-level/LFE switch to "Normal."

NOTE: If your receiver/processor has only one sub out, you may use either the L or R input.

If your receiver/processor does not have subwoofer outputs for the left and right channels or an LFE output:



OPERATION

Surround Modes

When using the TSS-450 in a Dolby* Digital or DTS home theater system, make sure all speakers are set to "Small." When using the system in a Dolby Pro Logic* home theater system, make sure the receiver's center channel mode is set to "Normal."

Some Dolby Digital-equipped receivers/processors offer different setup options for each source or surround mode, e.g., CD-stereo, videotape, Dolby Digital, Pro Logic. In each case, follow your equipment's instructions to ensure that the subwoofer output is turned on and that the speakers are set to "Small" in each mode.

If your receiver has adjustable crossover settings, we recommend the subwoofer crossover be set between 100Hz – 120Hz.

Power On

Plug your subwoofer's AC cord into a wall outlet. Do not use the outlets on the back of the receiver.

Initially set the Subwoofer Level Control ❺ to the "MIN" position.

Turn on the subwoofer by pressing the Power Switch ❻ on the rear panel.

Turn on your entire audio system and start a CD or movie soundtrack at a moderate level.

Auto On/Stand-By

With the Power Switch ❻ in the AUTO position, the LED on the rear panel will remain lit in red or green to indicate the On/Stand-By mode of the subwoofer.

RED = STAND-BY (No signal detected, Amp Off)

GREEN = ON (Signal detected, Amp On)

The subwoofer will automatically enter the Stand-By mode after approximately 10 minutes when no signal is detected from your system. The subwoofer will then power ON instantly when a signal is detected. During periods of normal use, the Power Switch ❻ can be left on. You may turn off the Power Switch ❻ for extended periods of nonoperation, e.g., when you are away on vacation.

Adjust Level

Turn the Subwoofer Level Control ❺ up about half way. If no sound emanates from the subwoofer, check the AC-line cord and input cables. Are the connectors on the cables making proper contact? Is the AC plug connected to a "live" receptacle? Has the Power Switch ❻ been pressed to the "On" position? Once you have confirmed that the subwoofer is active, proceed by playing a CD or DVD. Use a selection that has ample bass information.

Set the overall volume control of the receiver/processor to a comfortable level. Adjust the Subwoofer Level Control ❺ until you obtain a pleasing blend of bass. Bass response should not overpower the room but rather be adjusted so there is a harmonious blend across the entire musical range. Many users have a tendency to set the subwoofer volume too loud, adhering to the belief that a subwoofer is there to produce lots of bass. This is not entirely true. A subwoofer is there to enhance bass, extending the response of the entire system so the bass can be felt as well as heard. However, overall balance must be maintained or the music will not sound natural. An experienced listener will set the volume of the subwoofer so its impact on bass response is always there but never obtrusive.

TROUBLESHOOTING

If there is no sound from any of the speakers:
• Check that receiver/amplifier is on and a source is playing.
• Check that the powered subwoofer is plugged in, its Power switch is switched on to the "●" position, and the "Auto/On" switch is either in the "On" or "Auto" position.
• Check all wires and connections between receiver/amplifier and speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut or punctured.
• Review proper operation of your receiver/amplifier.

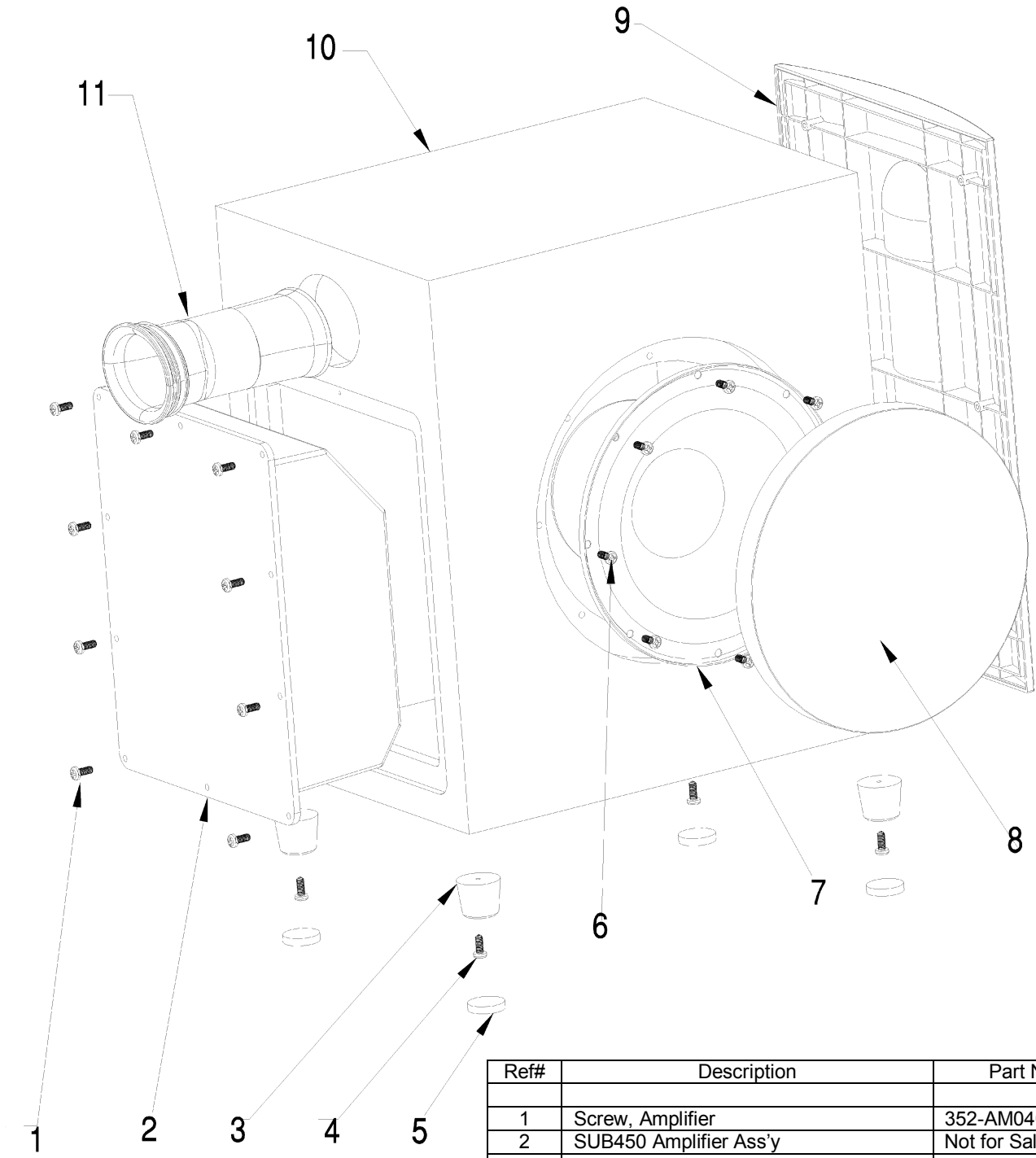
If there is no sound coming from one speaker:
• Check the "Balance" control on your receiver/amplifier.
• Check all wires and connections between receiver/amplifier and speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut or punctured.
• In Dolby Digital or DTS modes, make sure that the receiver/processor is configured so that the speaker in question is enabled.

If there is no sound from the center speaker:
• Check all wires and connections between receiver/amplifier and speaker. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut or punctured.
• If your receiver/processor is set in Dolby Pro Logic mode, make sure the center speaker is not in phantom mode.
• If your receiver/processor is set in Dolby Digital or DTS mode, make sure the receiver/processor is configured so that the center speaker is enabled.

If the system plays at low volumes but shuts off as volume is increased:
• Check all wires and connections between receiver/amplifier and speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut or punctured.
• If more than one pair of main speakers is being used, check the minimum impedance requirements of your receiver/amplifier.

If there is low (or no) bass output:
• Make sure the connections to the left and right "Speaker Inputs" have the correct polarity (+ and –).
• Make sure the subwoofer is plugged into an active electrical outlet.
• Make sure the powered subwoofer is plugged in and is either in the "On" or "Auto" position.
• In Dolby Digital or DTS modes, make sure your receiver/processor is configured so that the subwoofer and LFE output are enabled.

If there is no sound from the surround speakers:
• Check all wires and connections between receiver/amplifier and speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut or punctured.
• Review proper operation of your receiver/amplifier and its surround-sound features.
• Make sure the movie or TV show you are watching is recorded in a surround-sound mode. If it is not, check to see if your receiver/ amplifier has other surround modes you may use.
• In Dolby Digital or DTS modes, make sure your receiver/processor is configured so that the surround speakers are enabled.
• Review the operation of your DVD player and the jacket of your DVD to make sure that the DVD features the desired Dolby Digital or DTS mode, and that you have properly selected that mode using both the DVD player's menu and the DVD disc's menu.



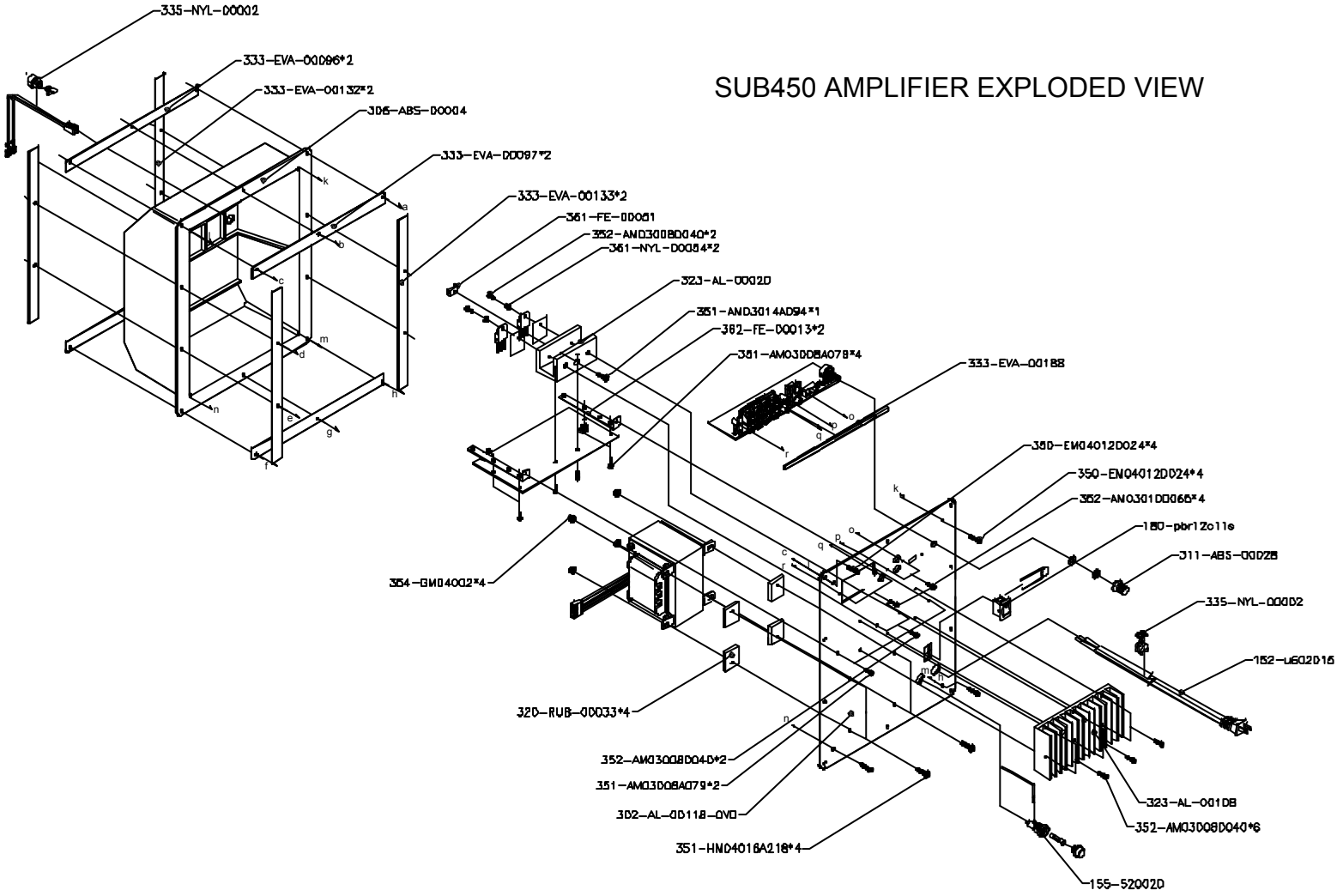
Ref#	Description	Part Number	Qty
1	Screw, Amplifier	352-AM04020D210	10
2	SUB450 Amplifier Ass'y	Not for Sale	1
3	Feet	320-RUB-00195	4
4	Screw, Foot	352-CM04025D604	4
5	Foot Pad	320-RUB-00199	4
6	Screw, Woofer	352-FM04020D605	8
7	8" (203mm) Woofer DCR = 3.3Ω ±10%	20MF10DAG-DW01	1
8	Grille	329-080-00736B/S	1
9	Front Faceplate	Not for Sale	1
10	SUB450 cabinet	Not for Sale	1
11	Port Tube	249-HIPS-00172B/S	1

SERVICE NOTE

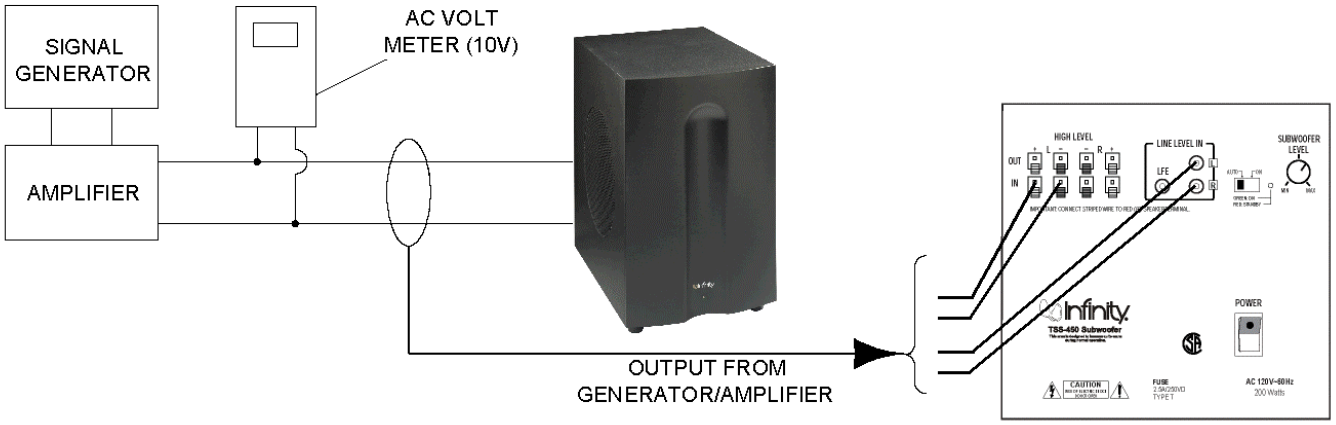
Access to woofer:

1) Carefully pry metal grille out of its recess with a sharp pointed instrument such as an awl – USE CAUTION. Work evenly around the perimeter until the grill can be removed.
2) Remove the (8) Phillips screws holding the woofer to the cabinet.
3) After service, replace the woofer and re-insert the grille back into its recess until it's fully seated.

SUB450 AMPLIFIER EXPLODED VIEW



Test Set Up and Procedure



Equipment needed:
- Function/signal generator/sweep generator
- Integrated Amplifier
- Multimeter
- Speaker cables

General Unit Function (UUT = Unit Under Test)
1) From the signal generator, connect one line level (RCA) cable to the Subwoofer Line Level Input jacks L/R on the UUT. Use a Y-cable from a mono source if necessary to connect to both inputs. Do not connect to the single LFE input.
2) On the front of the unit, turn the LEVEL control full counterclockwise.
3) Turn on generator, adjust to **100mV, 50 Hz**.
4) Plug in UUT; turn the power switch ON. LED should be Red. Turn LEVEL control full clockwise (MAX)
5) LED should now be Green; immediate bass response should be heard and felt from port tube opening.
6) Turn off generator, turn LEVEL control fully counterclockwise, disconnect RCA cable.
7) Connect one pair of speaker cables to Speaker Level input terminal (IN) on UUT. Cables should be connected to an integrated amplifier fed by the signal generator.
8) Turn on generator and adjust so that speaker level input at the amplifier is **2.0V, 50 Hz**. Turn LEVEL control full clockwise.
9) Green LED should light, immediate bass response should be heard and felt from the port tube opening.

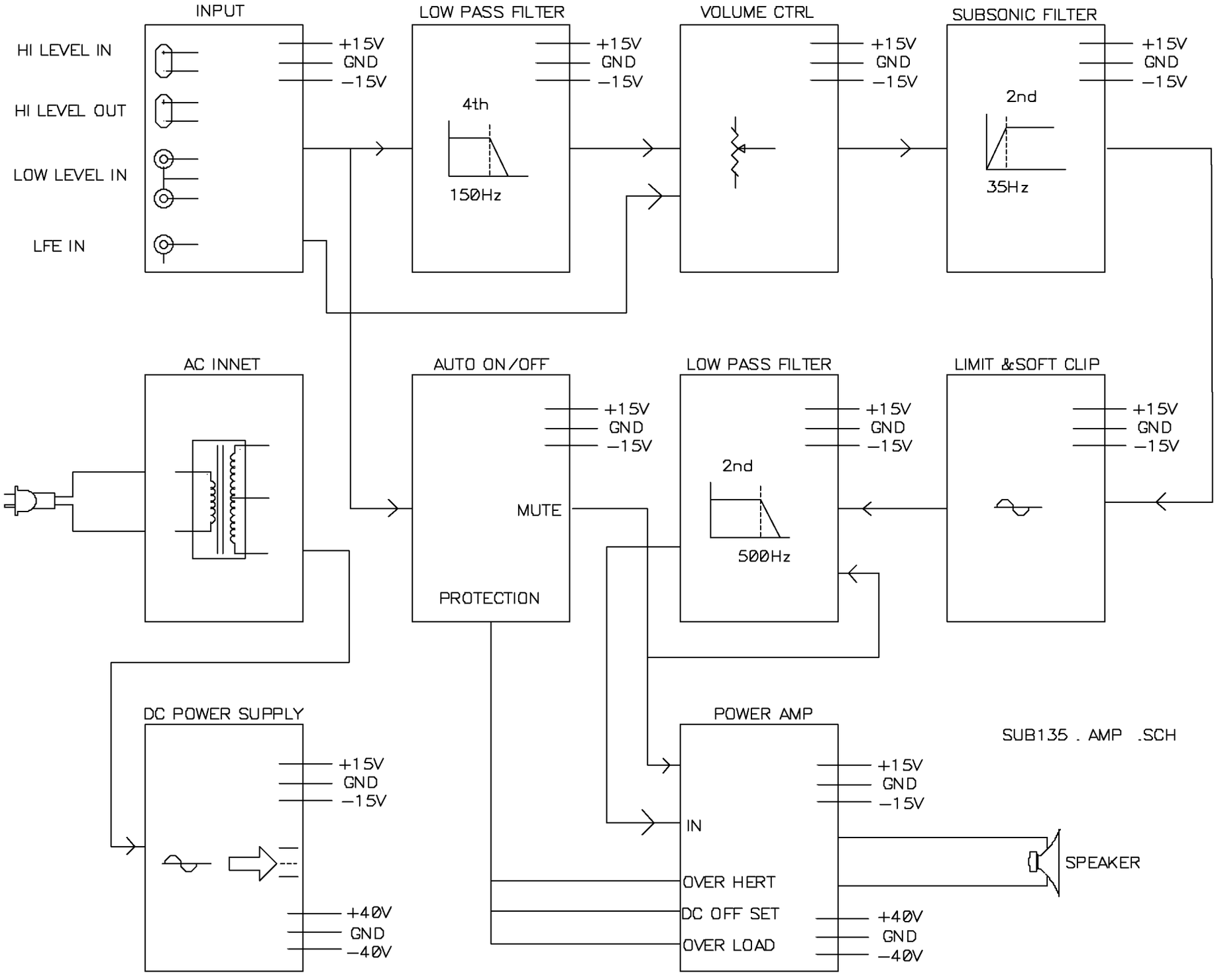
Sweep Function

1) Follow steps 7-9 above, using a sweep generator as a signal source.
2) Sweep generator from 20Hz to 300Hz. Listen to the cabinet and drivers for any rattles, clicks, buzzes or any other noises. If any unusual noises are heard, remove woofers and test.

Driver Function

1) Remove woofer from cabinet; detach + and - wire clips.
2) Check DC resistance of woofer; it should be **3.3 ohms** ±10%
3) Connect a pair of speaker cables to driver terminals. Cables should be connected to an integrated amplifier fed by a signal generator. Turn on generator and adjust so that speaker level output is **5.0**V.
4) Sweep generator from 20Hz to 1kHz. Listen to driver for any rubbing, buzzing, or other unusual noises.

BLOCK DIAGRAM



SUB 450 Electrical Parts List			
Part Number	Description	Qty	Reference Designator
Resistors			
110-14122j26	RES 1.2K 1/4W 5% CF 26mm	1	R265
110-14472j26	RES 4.7K 1/4W 5% CF 26mm	4	R147,150,201,202
110-14681j26	RES 680 1/4W 5% CF 26mm	2	R148,151
110-16101j26	RES 100 1/6W 5% CF 26mm	4	R120,213,214,215
110-16102j26	RES 1K 1/6W 5% CF 26mm	2	R124,254
110-16103j26	RES 10K 1/6W 5% CF 26mm	25	R134,209,212,216,217,220,221,222,225,226,228,229, 230,232,235,240,260,264,301,303,304,308,309,314
110-16104j26	RES 100K 1/6W 5% CF 26mm	1	R231
110-16105j26	RES 1M 1/6W 5% CF 26mm	2	R143,259
110-16123j26	RES 12K 1/6W 5% CF 26mm	2	R135,139
110-16124j26	RES 120K 1/6W 5% CF 26mm	1	R233
110-16151j26	RES150 1/6W 5% CF 26mm	1	R253
110-16152j26	RES 1.5K 1/6W 5% CF 26mm	6	R103,123,136,137,141,142
110-16153j26	RES 15K 1/6W 5% CF 26mm	5	R118,145,152,154,234
110-16154j26	RES 150K 1/6W 5% CF 26mm	2	R131,252
110-16181j26	RES 180 1/6W 5% CF 26mm	2	R111,114
110-16182j26	RES 1.8K 1/6W 5% CF 26mm	1	R153
110-16183j26	RES 18K 1/6W 5% CF 26mm	2	R227,262
110-16223j26	RES 22K 1/6W 5% CF 26mm	10	R128,129,133,237,238,255,256,263,310,312
110-16273j26	RES 27K 1/6W 5% CF 26mm	1	R223
110-16205j26	RES 2M 1/6W 5% CF 26mm	1	R257
110-16332j26	RES 3.3K 1/6W 5% CF 26mm	5	R106,107,144,236,258
110-16333j26	RES 33K 1/6W 5% CF 26mm	1	R305
110-16392j26	RES 3.9K 1/6W 5% CF 26mm	2	R105,108
110-16393j26	RES 39K 1/6W 5% CF 26mm	1	R126
110-16470j26	RES 47 1/6W 5% CF 26mm	4	R112,113,115,116
110-16471j26	RES 470 1/6W 5% CF 26mm	1	R140
110-16472j26	RES 4.7K 1/6W 5% CF 26mm	5	R110,125,130,207,208
110-16473j26	RES 47K 1/6W 5% CF 26mm	5	R101,219,249,250,251
110-16474j26	RES 470K 1/6W 5% CF 26mm	1	R307
110-16512j26	RES 5.1K 1/6W 5% CF 26mm	2	R210,211
110-16513j26	RES 51K 1/6W 5% CF 26mm	1	R224
110-16560j26	RES 56 1/6W 5% CF 26mm	1	R117
110-16563j26	RES 56K 1/6W 5% CF 26mm	1	R104
110-16682j26	RES 6.8K 1/6W 5% CF 26mm	1	R109
110-16751j26	RES 750 1/6W 5% CF 26mm	2	R311,313
110-16755j26	RES 7.5M 1/6W 5% CF 26mm	1	R306
110-16913j26	RES 91K 1/6W 5% CF 26mm	4	R203,204,205,206
110-10821jk1	RES 820 1W 5% □□□□5mm	1	R132
110-122r2j15	RES 2.2 1/2W 5% □□□□15mm	1	R127
110-20331jk2	Resistor 330Ω 2W ±5%	1	R146
110-20331jk3	Resistor 330Ω 2W ±5%	1	R149
114-03302m0	Semi-solid resistor 3K 0.3W ±20%	1	R138
115-h503a101	VR D16 50K/1 A LEVEL POT	1	VR201
110-16153j26	Resistor 15K 1/6W ±5% CF 26mm	1	R302
113-50r10j20	Resistor 0.1Ω 5W ±5%	2	R121,122

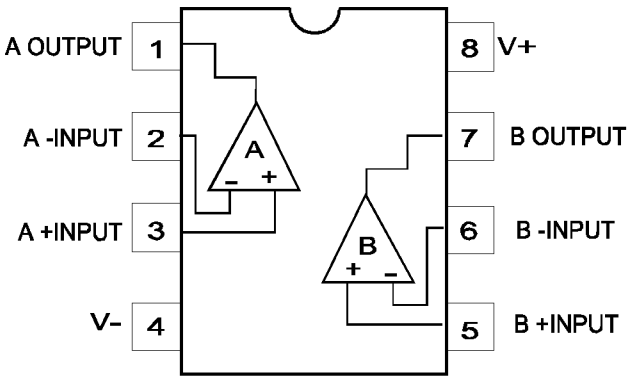
Part Number	Description	Qty	Reference Designator
Capacitors			
130-3f472md00	Ceramic Cap 4700pf 400v +/- 20%	1	ON POWER SWITCH
130-2b101k503	CD 100P 50V 10%	3	C207,214,220
130-2b102k503	CD 1000P 50V 10%	2	C116,203
130-2b221k503	CD 220P 50V 10%	6	C204,205,210,211,212,230
130-2b681k503	CD 680P 50V 10%	1	C208
130-2f104z503	CD 0.1U 50V +80/-20%	13	C108,113,115,119,232,235,236,237,239,240,241,305, 306
130-3f473m503	CD 0.047U 50V 20%	2	C106,209
130-sl470k503	CD 47P 50V 10%	1	C229
132-103j503	MC 0.01U 50V 5%	2	C223,224
132-104j503	MC 0.1U 50V 5%	4	C107,218,221,222
132-223ja03	MC 0.022U 100V 5%	5	C124,125,126,128,215
132-473j503	MC 0.047U 50V 5%	2	C216,217
132-103j503	MC 0.01U 50V 5%	2	C302,305
135-3105m50	EC 1U 50V 20%	3	C105,112,228
135-3106m50	EC 10U 50V 20%	6	C201,202,206,213,219,231
135-3107m16	EC 100U 16V 20%	6	C109,117,120,234,238,242
135-3226m50	EC 22U 50V 20%	4	C114,118,225,301
135-3227m10	EC 220U 10V 20%	2	C129,130
135-3227m16	EC 220U 16V 20%	2	C111,233
135-3476m25	EC 47U 25V 20%	1	C103,304
132-223ja03	MC 0.022U 100V 5%	2	C123,127
135-3107M16	EC 100U 16V 20%	1	C110
135-4688m50	EC 6800U 50V 20% D25X45mm□□	2	C121,122
Semiconductors			
192-027c1815gr	TR 2SC1815GR NPN	8	Q102,111,112,113,118,206,207,208
192-028a1015gr	TR 2SA1015GR PNP	2	Q114,116
192-1672n5551	TR 2N5551 NPN	2	Q103,109
192-1682n5401	TR 2N5401 AI-PNP 500mA TO-92	2	Q104,110
197-131n4148	DIODE 1N4148 26mm	9	D101,103,105,108,201,202,206,207,208
199-15000335	ZENER 3.3V 1/2W 26mm	2	D102,205
199-15000625	ZENER 6.2V 1/2W 26mm	2	D106,107
199-15001605	ZENER 16V 1/2W 26mm	1	D109
192-021c1815gr	TR 2SC1815GR NPN	4	Q101,115
192-991d669a	TR 2SD669A NPN	1	Q106
192-021tip35c	TR TIP35C NPN	1	Q107
192-992b649t	TR 2SB649A PNP	1	Q105
192-022tip36c	TR TIP36C PNP	1	Q108
192-201d882y	TR KSD882Y PNP	1	Q117
192-202b772y	TR KSB772Y PNP	1	Q119
190-06m4558d	IC OPA 4558D DUAL OP-AMP	2	U101,203
190-16tl074cn	IC TL074CN ST QUAD OP-AMP	3	U201,202,301
195-10204hgw	LED 204HGW	1	D209
197-101n4002	DIODE 1N4002	1	D104
197-131n4148	DIODE 1N4148	2	D301,302

Part Number	Description	Qty	Reference Designator
197-00kbl405	BD 4A 500V KBL405 BRIDGE	1	D110
192-027c1815gr	Transistor 2SC1815GR	2	Q301,Q302
162-50332003	2PIN 330mm RED LED	1	D209
Miscellaneous			
156-b010010	TUBE 1*10mm	2	FOR Q101,115
171-udhss124d	RELAY 5A 24V UDH-SS124D	1	RY101
174-0rcb202v	RCA JACK RCB-202V	1	JK202
174-0rcb242v1	JACK RCA RCB-242V-1	1	JK203
174-2rsp108v	8PIN SPK JACK RSP-108V	1	JK201
193-3m2520	ISLATOR MICA TO-3P 25*20mm	2	FOR Q107,108
180-tms7210v	SW210 AUTO/ON SLIDE SWITCH	1	
180-PBR12C11S	POWER PUSH SW. BR12C11S	1	
152-U602015	AC CORD SVT FT-2 6FT	1	
155-520020	FUSE HOLDER R3-11	1	
154-U25006T0	FUSE 2.5A 250V 20mm	1	
700-KB800	SUB. LEVEL KNOB	1	
150-E8604107	TRANSFORMER EI-86 60HZ 120V TT0869906580	1	
351-AM03008A079	Screw M3*8 black	6	
351-HM04016A218	Screw M4*16 black	4	
354-GM04002	Screw with screw plate M4	4	
352-AM03008D040	Screw □3*8 type B black	8	
352-AM03010D065	Screw □3*10 type P black	4	
350-EM04012D024	Screw 4□*12 black	4	
152-u602015	Power wire SVT FT-26FT	1	
162-10082007	Wire red 18AWG 80mm	1	
162-a040d001	Speaker wire #1015 400mm	1	
176-wjce1	Closing terminal CE-1	1	
302-AL-00118-0VD	Alu. panel 215*270*2.5t	1	
323-AL-00108	HEAT SINK 117.5*60*25	1	
311-ABS-00028	Plastic knob 46077-W P.V.C.	1	
306-ABS-00004	Plastic cover 268*213*102A.B.S UL	1	
333-EVA-00096	EVA caution 213*15*2.0mm	2	
333-EVA-00097	EVA caution 213*15*1.0t	2	
333-EVA-00132	EVA caution 238*15*2.0mm	2	
333-EVA-00133	EVA caution 238*15*1.0t	2	
333-EVA-00220	EVA caution 225*15*1t UL	1	
320-RUB-00033	Rubber sheet 25*21*4t	4	
362-FE-00013	PCB holder L TYPE t=1.6mmS.P.C.C	2	
175-1c07v01	Connector 7PIN PITCH=2.5mm	1	P101
175-1d02v01	Connector 2PIN PITCH=3.96mm	1	P102
175-1d03v01	Connector 3 PIN PITCH=3.96mmJST-VH	1	P103
193-3m2520	Piezo TO-3P 25x20mm	2	for Q107,Q108
323-AL-00020	HEAT SINK 65*32*31	1	
361-NYL-00054	Diode insulated sheet (SW06002)	2	

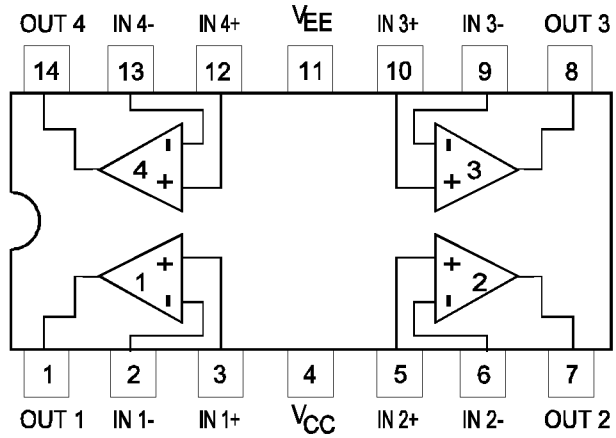
Part Number	Description	Qty	Reference Designator
361-FE-00051	Diode solid sheet 14.2*8.0*5.2t=1.6mm	1	
156-h010010	Heat thimble 1ψ*10mm	2	
162-50129001	CABLE ASS'Y 120mm AWG28WHT	1	P302
175-9f40hr2	Connector 40PIN PITCH=2.54mmHR2*40		
162-10059001	Wire 50mm WHITE UL1007 AWG266:6	1	

Integrated Circuit Diagrams

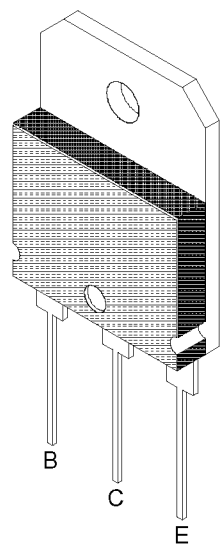
4558 DUAL OP AMP,
U101, 203



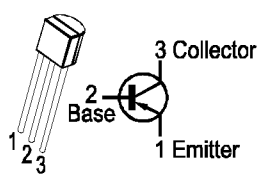
OPAMP, QUAD 14P DIL TL074
U201, 202, 301



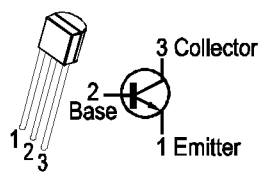
TIP35C NPN,
TIP36C PNP,
Q107,108



TRANS, PNP, 2N5401 TAP,
TO-92,
Q104,110

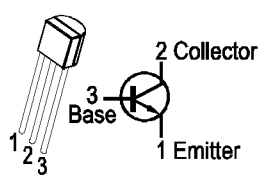


TRANS, NPN, 2N5551 TAP,
Q103,109

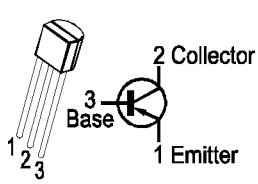


TRANS, NPN, 2SC1815GR TAP,

Q101,102,111,112,
113,115,118,206-208,301,302



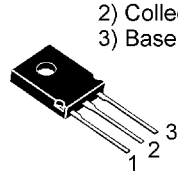
TRANS, PNP, TAP,
2SA1015GR
Q114,116

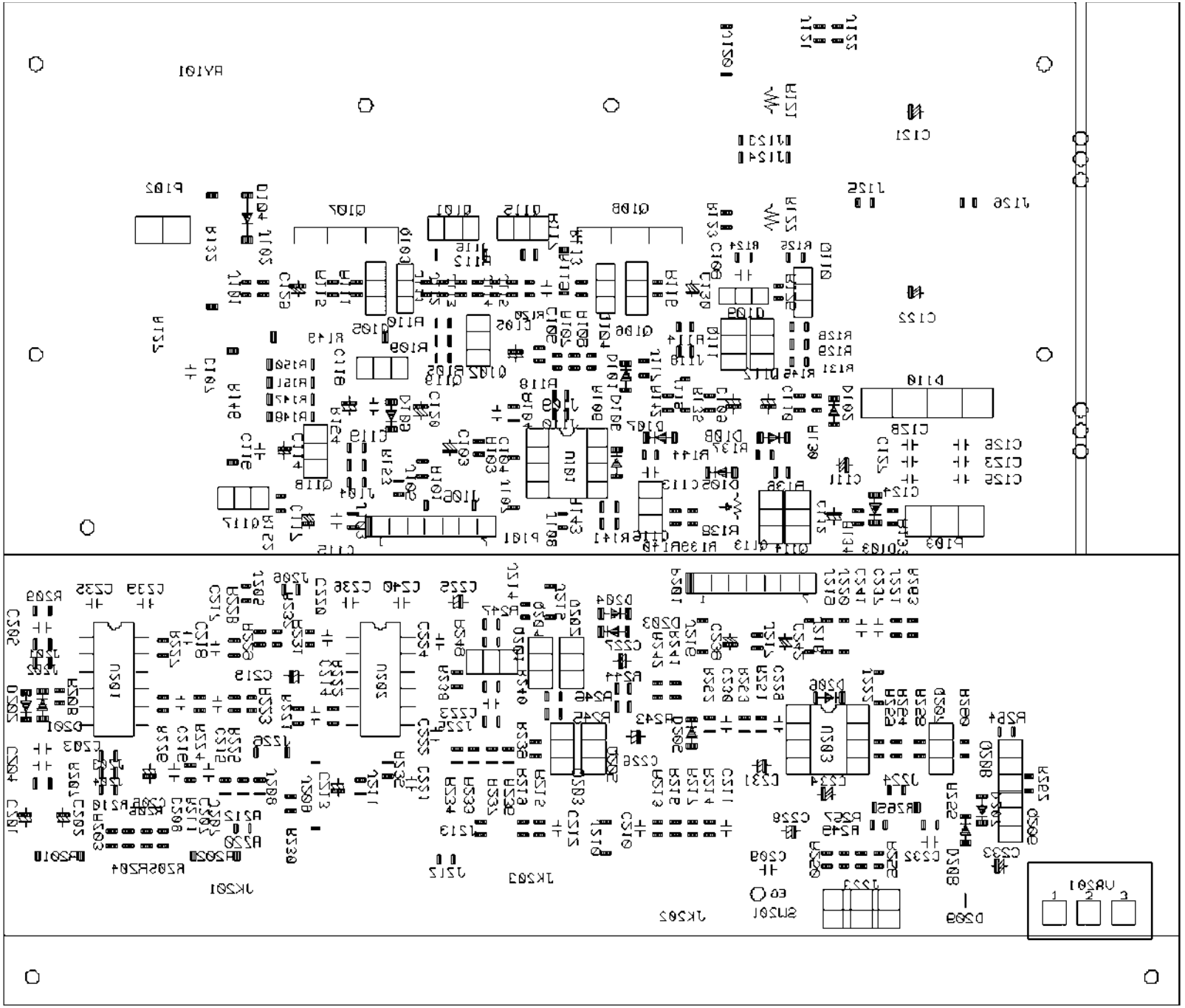


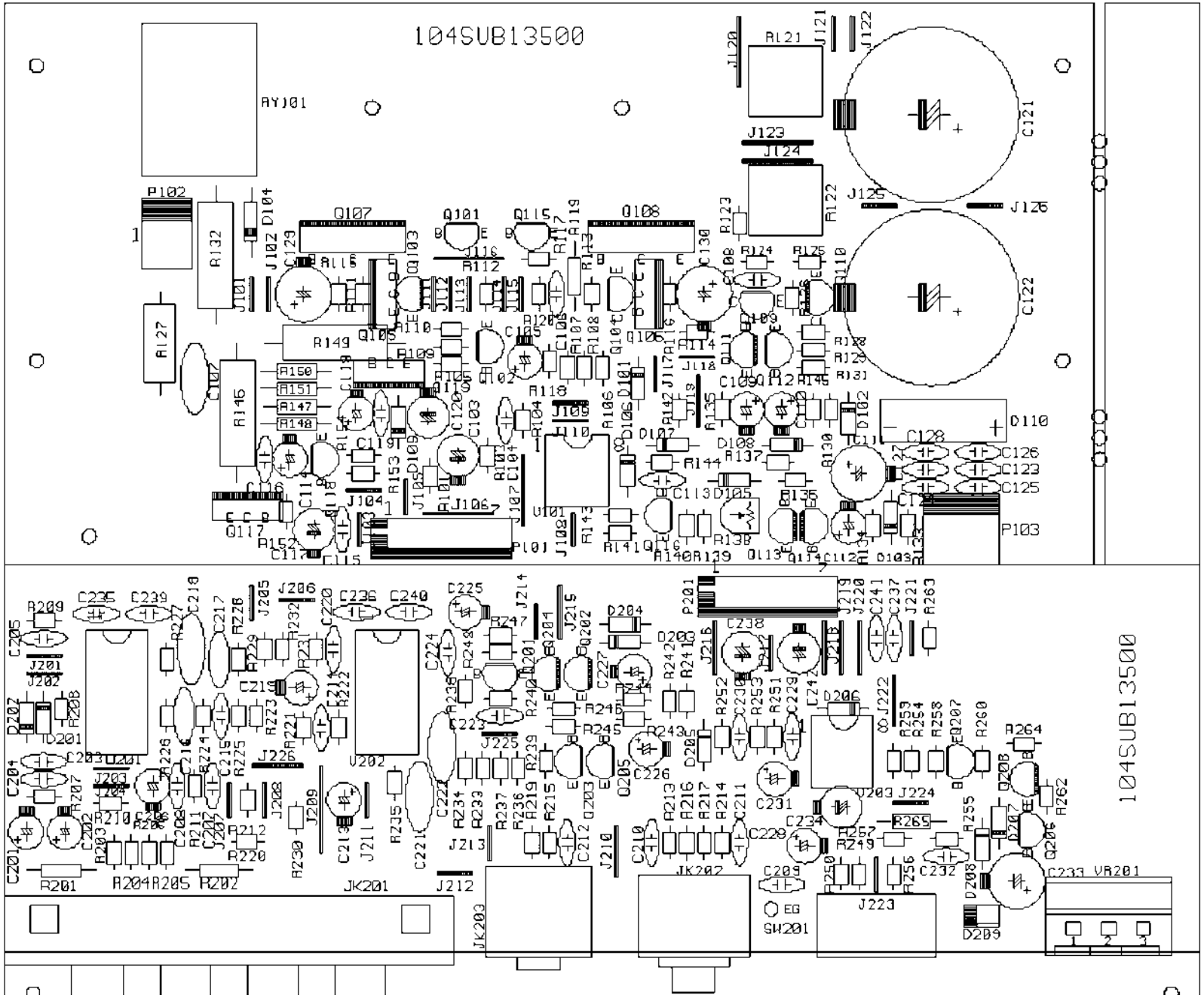
KSD882Y,KSB772Y
2SD669A,2SB649A

Q105,106
117,119

1) Emitter
2) Collector
3) Base






104SUB13500
104SUB13500
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Q101
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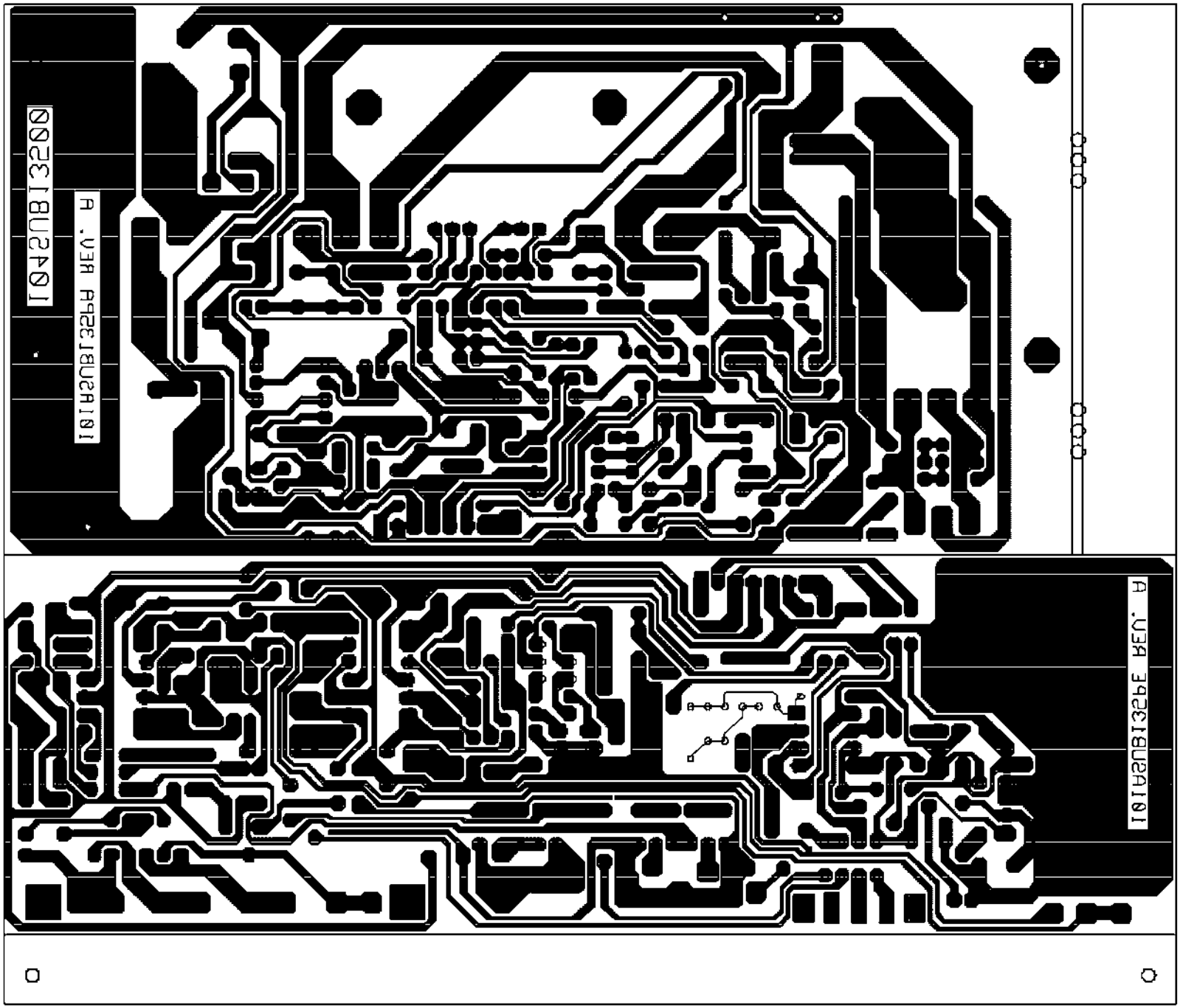
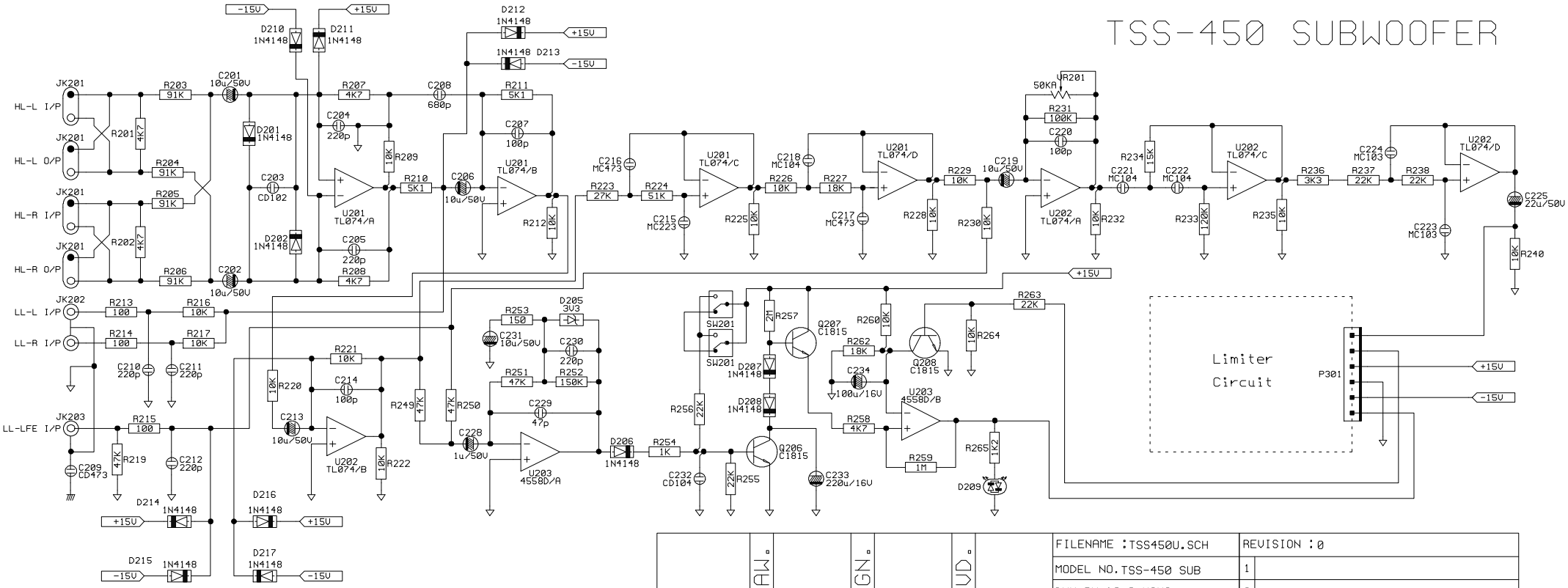
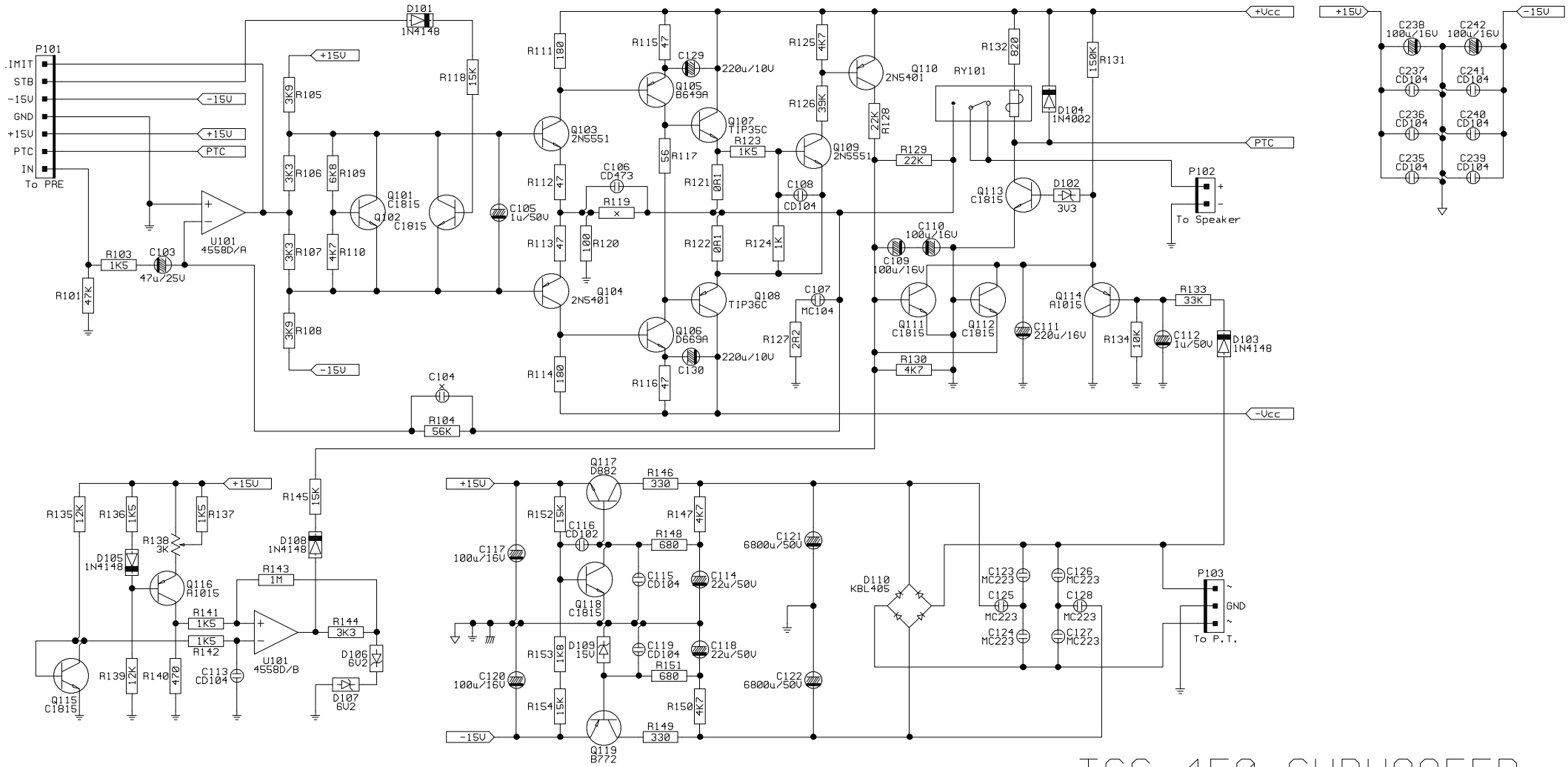
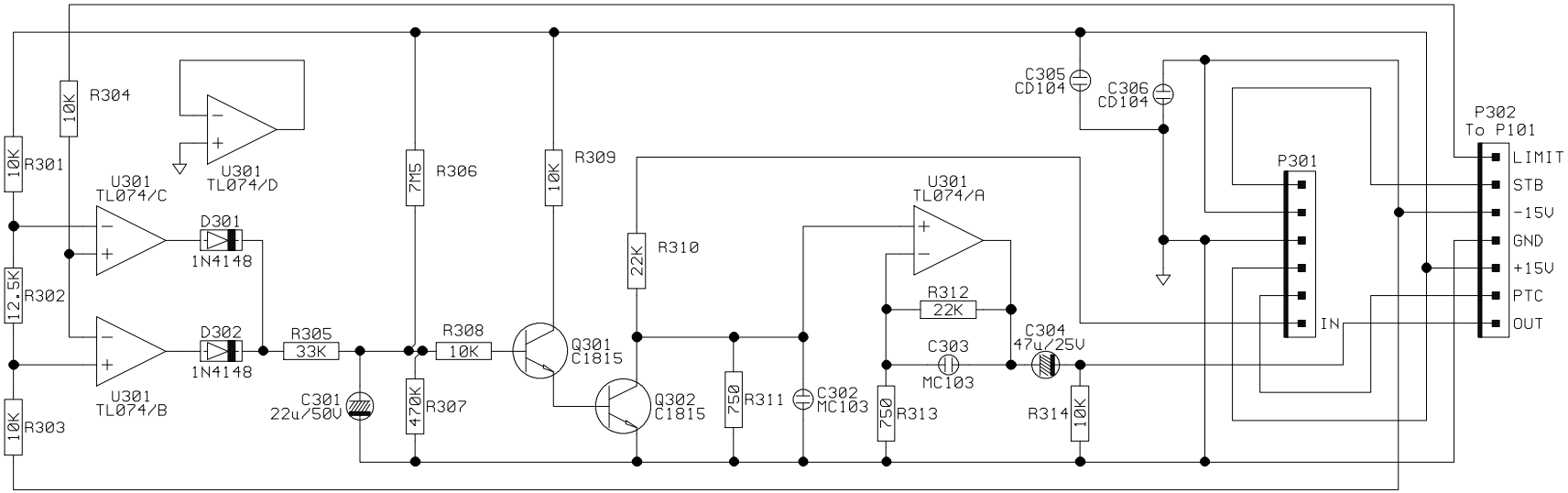
VR201
SW201
EG
R201
R204R205
R202


1014SUB13200
A .VER ASSEMBLY
1014SUB13200 A .VER ASSEMBLY


TSS-450 SUBWOOFER
HL-L I/P
HL-L O/P
HL-R I/P
HL-R O/P
LL-L I/P
LL-R I/P
LL-LFE I/P
Limiter
Circuit
P301
DRAW.
DSGN.
APVD.
FILENAME :TSS450U.SCH
REVISION :0
MODEL NO.TSS-450 SUB
DWN BY :C.S.WANG
DATE :2003-07-02



TSS-450 SUBWOOFER


R304
10K
R301
10K
U301
TL074/C
U301
TL074/D
D301
1N4148
R302
12.5K
D302
1N4148
R305
33K
U301
TL074/B
R303
10K
C301
22u/50V
7M5
R306
470K
R307
R308
10K
10K
R309
Q301
C1815
Q302
C1815
22K
R310
750
R311
C302
MC103
U301
TL074/A
R312
22K
C303
MC103
750
R313
C304
47u/25V
R314
10K
C305
CD104
C306
CD104
P301
IN
P302
To P101
LIMIT
STB
-15V
GND
+15V
PTC
OUT

WIRING DIAGRAM